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REMARKS/ARGUMENTS

The above amendments and the remarks below are in response to an Office Action mailed on October 29, 2003. In the Office Action, Claims 10-13 were found to be allowable, and Claims 3-5 and 17-19 were objected to for being dependent upon a rejected base claim, but were otherwise also found to be allowable. The remaining pending Claims 1, 2, 6-9, 14-16, 20 and 21 were rejected under 35 U.S.C. §§102(b) and 103(a) over U.S. Patents Nos. 5,152,949 to Leoni et al. ("Leoni"); 5,902,535 to Burgess et al. ("Burgess") and 5,441,692 to Taricco ("Taricco"). Previously withdrawn Claims 22-35 have been cancelled without prejudice.

Claims 3 and 17 have been amended to include the recitations of their respective parent claims. Claims 4, 5, 18 and 19 depend from Claims 3 and 17. The objections to Claims 3-5 and 17-19 have therefore been overcome, and these claims should be in a condition for allowance.

Leoni discloses a rigid mold assembly 10 having a rigid mold subassembly 12 and a compliant mold subassembly 30, as shown in Figure 1 of Leoni. The rigid mold subassembly includes a female mold 14 having resin injection ports 26, one or more vents 28 and a cover plate 20. The compliant subassembly includes a plurality of conformable cauls 32 and a liner 36. The liner cooperates with the cover plate to define the vacuum chamber for impregnating resin into the composite. The conformable cauls of Leoni are positioned adjacent the liner and can include a facing surface 34b to accommodate rigid mandrels 42 "that provide structurally strengthened, indented surface areas in the finished composite article," as described at column 5, lines 67-68 and column 6, lines 1-2 of Leoni.

During resin infusion, several steps are required, including first and second pressurization steps at two different pressures (P1 and P2) to cause evacuation of a plenum 52, closure of the ports and placement in an oven OV for curing, as described at column 9, lines 63-68 and column 10, lines 1-55 of Leoni.

Burgess discloses a molding tool 10 including an outer mold tool 12 having a facing sheet 14 along which a resin film 18 is positioned, as shown in Figure 1 of Burgess. A preform assembly 20 having a plurality of stringers and intercostals is positioned on the resin film. Positioned opposite the outer mold tool, and in engagement with the resin film, are a plurality of

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mandrels 32 of an inner mold tool 30. Once assembled, these components are bagged, a vacuum is applied within the bag and the tool assembly is placed in an autoclave to melt and distribute the resin film.

Taricco discloses a vacuum assisted resin transfer molding system 10 including an autoclave 12, as shown in Figure 1 of Taricco. The autoclave includes a tank 14 that has an inner chamber 16 in which is placed a tool 24 having a fibrous sheet 26 (which is combined with resin to create a composite material) covered by a cover plate 28. The cover plate may be constructed of a flexible nylon, as described at column 3, lines 8-9 of Taricco. Flexible joints 36 provide fluid communication between the inner cavity 30 and a pump system 32 located outside of the tank. The pump system can pressurize or create a vacuum in the inner cavity. During compression, resin flows out of the inner cavity via the flexible joints to the pump system.

Claims 1, 2, 6 and 8 were rejected under 35 U.S.C. §102(b) as being anticipated by Leoni. In addition, Claims 1, 2, 6, 7 and 9 were rejected under 35 U.S.C. §102(b) as being anticipated by Burgess.

Claim 1 has been amended to recite a tight tolerance at the hard interface that is within ± 0.015 inches or less. Leoni teaches conformable cauls with a facing surface to provide structurally strengthened, indented surface areas on the finished composite article. However, Leoni neither teaches, nor suggests, that mold line tools and a vacuum supply may be configured to achieve tolerances of about ± 0.015 inches or less on a composite structure. In fact, Leoni does not mention any such specific tolerances at all for its resulting composite structure.

Burgess discloses a mold tool including a plurality of mandrels that form an interface with a preform during resin infusion, but does not disclose any specific tolerances achieved by using the tool assembly. Taricco also fails to disclose specific tolerances achievable in composite structures. As a result, Claim 1 is allowable over Leoni, Taricco, Burgess and the remaining cited references, alone and in combination, and the rejection of Claim 1 under 35 U.S.C. §102(b) has been overcome.

Claims 14-16, 20 and 21 were rejected under 35 U.S.C. §103(a) over Leoni in view of Taricco. In the Office Action, it was alleged in the rejection of Claim 15 that the fiber volumes of the preform and molded article are intended use limitations that do not further define the

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structure of the apparatus. However, Applicant wishes to clarify that Applicant intended to have the resin infusion apparatus include the pre-bleed fiber preform with the fiber volume of at least 53%. Essentially, then, the fiber preform would be part of the claimed resin infusion apparatus at the end of the infusion process.

Claim 14 has been amended to describe the pre-bleed fiber preform as having a fiber volume of at least 53%. Leoni discloses fiber preforms having a fiber-to-resin ratio of 60% to 65%, but not resulting from a resin infusion apparatus as described in Claim 14. The resin infusion apparatus of Claim 14 includes an autoclave with a pressurized chamber and a conduit passing from a bag of a mold assembly through an opening in the autoclave. Unlike Leoni, the apparatus of Claim 14 allows simultaneous curing and bleeding of the fiber preform. Leoni requires two pressure bleed steps at two different pressures, closure of bleed ports and then another step of curing in an autoclave.

Neither Tarrico, Burgess, nor the remaining cited references, teaches or suggests a fiber volume of any particular percentage, much less a fiber volume of at least 53% achieved with the combined mold assembly and autoclave of Claim 14 allowing simultaneous curing and pressure bleed. Claim 14, therefore, is patentable over Leoni, Tarrico, Burgess and the remaining cited references, alone and in combination, and the rejection of Claim 14 under 35 U.S.C. §103(a) has been overcome.

Each of the remaining rejected Claims 2, 6-9, 16, 20 and 21 depends from, and further patentably distinguishes, one of the allowable independent Claims 1 and 14. The rejections of Claims 2, 6-9, 16, 20 and 21 under 35 U.S.C. §§102(b) and 103(a) have therefore also been overcome. Claims 2, 6-9, 16, 20 and 21 are, as a result, also allowable.

Claim 15 has been cancelled due to Claim 14 being amended to include Claim 15's recitation of a fiber volume of at least 53%. A new Claim 36 has been added and describes a fiber preform bled to a fiber volume of at least 53% during a simultaneous pressure bleed and autoclave cycle.

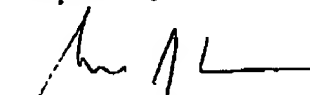
In view of the remarks and amendments presented above, it is respectfully submitted that claims of the present application are in condition for allowance. It is respectfully requested that a Notice of Allowance be issued in due course. The Examiner is requested to contact

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Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

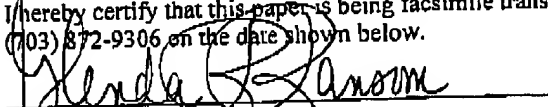
Respectfully submitted,

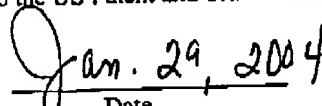

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